International Journal of Green Pharmacy 2018 vol.12 N2, pages S363-S367

Balance function control on the background of vestibular stimulation in athletes

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2018 BRNSS Publication Hub. All rights reserved. Aim: In sports activities, the athlete faces the problem of maintaining the balance of the body against the background of physical and sensory fatigue. The sum of physical and sensory fatigue results in an overload of the athlete's statokinetic system, which primarily leads to a decrease in vestibular stability and proprioceptive sensitivity, generation of muscle tension, changes in the central integration of sensory information, as well as to an impaired differentiation of fine movements, mismatch of regulation mechanisms, and speed of motor reactions. Materials and Methods: The body balance function was assessed using "Stabilan 01–2" stabilographic hardware–software complex (CJSC "OKB" "Ritm," Russia) by analyzing the oscillation of the pressure center. Vestibular stimulation was performed with the help of the Barany chair (Russia). Results: The assessment of the body balance function in athletes and persons not engaged in sports was conducted before and after vestibular stimulation. According to the data of the stabilographic test, the balance function of the athletes engaged in cyclic, situational, and precision sports did not differ. Conclusion: At the same time, the most significant differences in the regulation of the balance between athletes of different specializations are manifested after vestibular stimulation. Individuals not engage in sports have a lower level of quality of maintaining balance, as compared with athletes, which significantly decreased under the influence of vestibular stimulation.

Keywords

Athletes, Body balance, Sensory systems, Stabilographic indicators, Statokinetic stability, Vestibular stimulation

References

[1] Asseman FB, Caron O, Cremieux J. Are there specific conditions for which expertise in gymnastics could have an effect on postural control and performance? J Gait Posture 2008;27:76-81.

[2] Demura S, Uchiyama M. Influence of anaerobic and aerobic exercises on the center of pressure during an upright posture. J Exerc Sci Fit 2009;17:39-47.

[3] Melnikov AA, Savin AA, Emelyanova LV, Vikulov AD. Postural stability during static strain before and after a submaximal aerobic bicycle test in athletes. J Human Physiol 2012;38:176-81.

[4] Nazarenko AS, Chinkin AS. Cardiovascular, motor, and sensory responses to vestibular stimulation in athletes of different specializations. Human Physiol 2011;37:726-32.

[5] Nazarenko AS, Chinkin AS. Influence of vestibular irritation on stabilometric indicators of statokinetic stability of football players. Cent Eur J Sport Sci Med 2015;9:91-5.

[6] Paillard T, Montoya R, Dupui P. Postural adaptations specific to preferred throwing techniques practiced by competition-level judoists. J. Electromyogr Kinesiol 2007;17:241-4.

[7] Pinsault N, Vuillerme N. Differential postural effects of plantar-flexor muscles fatigue under normal, altered and improved vestibular and neck somatosensory conditions. Exp Brain Res 2008;191:99-107.

[8] Taylor JL, Gandevia SC. A comparison of central aspects of fatigue in submaximal and maximal voluntary contractions. J Appl Physiol 2008;104:542-50.

[9] Vuillerme N, Boisgontier M. Muscle fatigue degrades forcesenseattheanklejoint.GaitPosture2008;28:521-4.